A DISCRETE STOCHASTIC INTERPRETATION OF THE DOMINATIVE p-LAPLACIAN.

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The Dominative p-Laplacian introduced by Brustad for $2 \leq p < \infty$ is the operator

$$\mathcal{L}_p u(x) = \frac{1}{p}\left(\lambda_1 + \ldots + \lambda_{N-1}\right) + \frac{(p-1)}{p}\lambda_N,$$

where we have ordered the eigenvalues of $D^2u(x)$ as $\lambda_1 \leq \lambda_2 \ldots \leq \lambda_N$. The operator $\mathcal{L}_p$ is sublinear, therefore convex, and uniformly elliptic. Thus, the viscosity solutions of the equation $\mathcal{L}_p u(x) = 0$ are locally in the class $C^{2,\alpha}$.

In this talk, we first discuss the relation between $\mathcal{L}_p$ and the regular p-Laplacian and then present a discrete stochastic approximation to the unique viscosity solution of the Dirichlet problem for the Dominative p-Laplace Equation.

This is joint work with Karl Brustad (NTNU) and Peter Linqvist (NTNU).

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